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On our National Strength; tested by the Numbers, the Ages, and the Industrial Qualifications of the People. By JOHN YEATS, Esq., F.R.G.S.

[Read before the Statistical Section of the British Association at Glasgow, September, 1855.]

GREAT Britain has a relative as well as an absolute existence. It may be regarded as one of the industrial communities of the world, as the heart of the British empire, or as the home of the Anglo-Saxon people; in each of these points of view, however, it is becoming, territorially considered, of less and less importance. Taking the area of the United Kingdom as unity, and comparing it with the areas of other countries, we find that, roughly estimated, France and Spain are each half as large again; Turkey, in Europe, the same; in Asia she is more than four times the size; Austria and the German states are each twice as large; Norway and Sweden, together, are nearly two and a half times as large; Russia is seventeen times as large in Europe alone, and forty-five times as large in Asia. As respects the British dominions; Great Britain and Ireland are inferior in area to the Cape Colony and Natal; Canada is computed to be more than double the size; the states under our protection in India are three and a half times as large; British India is more than six and a half times as large; the Australian colonies and Van Diemen's Land are more than eleven times as large; the Hudson's Bay Territory is twenty-six times the size.

Our littoral frontiers cannot be extended unless the waves of the Atlantic subside; but the colonists, who have left our shores, are spreading in every direction, and anglicising so much of the globe, that we may safely assert the English language is spoken, and English habits and feelings are implanted, over a tract of the earth's surface fifty times as great as this our island home. The soil and other resources of surrounding states are improving nearly as fast as those of Great Britain; while the superiority we once enjoyed in the possession of raw material has been sensibly impaired by the increased facilities afforded by steam navigation for intercourse between the most distant parts. In the struggle now arising among nations, it is not capital of any kind, but productive power in the people, which will give supremacy. To that alone we can look for security. Our position in the world will not be maintained unless we put forth all the national strength, which lies chiefly in the Numbers, the Youthfulness, and the Industrial Qualities of the people.

With a single exception, England is the most densely peopled country in Europe. On good authority we have—

	Sq. Miles.	Population.	
England, Area	50,153	16,921,880 =	337 persons to 1 sq. mile.
Wales, do.	8,167	1,005,721 =	123 " "
Islands in British Seas	394	143,126 =	363 " "
Scotland, do.	31,324	2,888,742 =	92 " "
Ireland, do.	32,512	6,515,794 =	200 " "

Without going minutely into detail with other countries, we

learn that Belgium has 382 inhabitants to the square mile ; Saxony 328 ; Holland 242 ; Italy 208 ; Germany and Prussia 188 ; France 171 ; Austria 145 ; all Europe 82 ; Spain 81 ; Turkey 71 ; Russia 27 ; Norway and Sweden 16.

In absolute numbers, the population of Great Britain and the islands in the British seas, was on the 31st March, 1851, 21,121,967 ; and of the united kingdoms 27,637,761. As to the rate of growth, it has been calculated that the population of the same countries was, in—

1651	6,378,000	
1751	7,392,000 =	1,014,000 increase in the century
1851	21,185,000 =	13,793,000 " "

The increased production and distribution of wealth were in proportion to the increased numbers of the people, each century. The disparity in the ratio of increase, for the two centuries, is accounted for by discoveries in the art of medicine during the latter ; by improvement in the manners of the people ; by a more general and more practical recognition, than had previously existed, of the laws on which the well-being of mankind depends. There may be slight mistakes in the calculation, or, what is more probable, a deficiency in the data upon which it rests ; but it is, nevertheless, almost certain that, within one hundred years, two new nations, each equal in numbers, in wealth, and all the elements of prosperity to the third, were called into being, and located on the superficial area that originally contained but one of them. This is valid evidence of our capacity for growth, when the right means are applied. The United States of America have accomplished even more than this. Within fifty years, their population has increased from 5,300,000 to 23,100,000, or more than fourfold.

The course of events, during the last fifty years, is well worthy of attention. The numbers of the people were, in—

1801	10,917,433	1831	16,564,138
1811	12,424,122	1841	18,813,786
1821	14,402,643	1851	21,121,967

Thus, within the half century there has been an addition of ten millions of people, which nearly equals the produce of the preceding eighteen centuries. The increase of two millions three hundred thousand, during the last ten years, is also remarkable as a proof of prosperity ; but another view of it has to be taken.

The increase of persons, during the last ten years, was—

1,924,629 in England
94,343 Wales
270,023 Scotland
19,186 Islands in the British Seas

2,308,181 Increase in Great Britain
1,463,590 Deduct Decrease in Ireland

844,591 Increase in United Kingdom

or 3 per cent. only, making it smaller than that of some of the old states of Europe. Less satisfactory than this even, is the fact, that

while between 1831 and 1841 there was no county in England which exhibited a decrease in numbers; between 1841 and 1851, 27 counties in England and Wales showed sensible diminution, which extended itself more or less over the greater part of Ireland, the north of Scotland, the north of Wales, and the west of England.

As to the increase of wealth during the past half century, we observe in the report that:—"At 3 per cent per annum, compound interest, the value of capital is doubled in 24 years; and a population increasing at 3 per cent, which is near the natural rate, doubles in the same time; while actually the British population has increased at the rate of 1.329 per cent annually, for the fifty years 1801-1851, and has doubled in 53 years. Thus, if we take this indication, *the means of subsistence have increased faster than the numbers of the people*; for while the population has doubled, the value of capital, under investment at 3 per cent. compound interest, has quadrupled. While 100 people in Great Britain became 200 in 53 years, 100*l.* invested and allowed to accumulate, at 3 per cent. interest, became 479*l.* The produce of Great Britain, which in the present state of commerce is always convertible into the means of subsistence, has probably not increased at a lower ratio."

The value of real property assessed to the property and income tax, for Great Britain, was, in 1851, 105,524,491*l.*, viz.—94,809,106*l.* for England and Wales, and 10,715,385*l.* for Scotland. In 1814-15, the value of that property was 60,138,323*l.*, of which 53,495,368*l.* were for England and Wales, and 6,642,995*l.* for Scotland. Personal property, there is every reason to believe, increased much faster.*

* "The wealth of England has been estimated, but it must only be taken as an approximation to the true amount. The value of the cultivated soil, that is, the labour and wealth that is in the soil, is estimated at 1,700,000,000*l.*; mines, at 120,000,000*l.*; roads, canals, and other means of communication, at 500,000,000*l.*; dwellings, factories, and kindred erections, at 550,000,000*l.*; annual agricultural produce in land, the surplus of former years, and agricultural implements, at 230,000,000*l.*; horses, cattle, sheep, and other live stock, at 242,000,000*l.*; manufactured goods, new and in use, at 200,000,000*l.*; mercantile shipping, at 40,000,000*l.*; foreign merchandize paid for, at 50,000,000*l.*; fisheries, foreign and domestic, at 5,000,000*l.*; being a total of nearly 3,700,000,000*l.* Now this is a sum of which few persons understand the extent. But suppose it was before us in sovereigns, and that we could count twenty in a minute for twelve hours in the day, it would take about 800 years to get through them. This immense sum, however, does not include the coin which is in circulation in the British isles. The gold and silver is nearly 40,000,000*l.*, besides copper, bank notes, bills, and other mediums of circulation. The gold, also, which is in the coffers of the Bank of England is not included. The amount of this fluctuates, but it is seldom less than 15,000,000*l.* Now this 40,000,000*l.* of gold and silver, which is in actual circulation, and the 15,000,000*l.* in the Bank of England, and other sums similarly situated, will amount to nearly 60,000,000*l.* more. Here, then, we have a realized capital of 3,760,000,000*l.* of productive property in the British isles. This amazing sum is all at work in the three kingdoms, and forms our capital in trade. But besides this, we have an enormous sum in what may be called unproductive property. This may be enumerated as follows:—Waste land, public buildings, churches, chapels, hospitals, prisons, arsenals, forts, military stores, dock-yards, ships of war, &c. All this is estimated as being equal to the national debt, about 750 millions. It may, therefore, be said that, notwithstanding our enormous debt, which we must remember is not owing to foreigners, but to Englishmen, we have the entire of our productive capital of three billions seven hundred and sixty millions clear, independently of what other nations owe to us. Now this large sum, which represents everything that is useful and agreeable, and which affords sub-

But having seen this twofold progress in numbers, and in corresponding wealth, we must remember that the aggregate prosperity of the people does not apply to every individual, nor indeed to some very large classes. The whole of a people is, perhaps, never progressive. Amongst contemporaries, fellow countrymen and fellow citizens, the various stages in the growth of society are constantly visible. Independent of the distinctions of race, the Celt on the hill-top herding cattle, the Anglo-Saxon farming in the plains, and the Scandinavian mariner fishing or cruising along the coasts, past ages are ever reappearing in the present.

And there is not a greater difference between one generation and another, than there is between one man and another. Beside the manufacturer and the merchant prince, we have, in 1855, poverty-stricken and unenlightened thousands; not only a large proportion of adults unable to read or write, but very nearly 50 per cent. of the rising generation left wholly uninstructed. Of 4,694,583 children of the ages 5-15, only 2,405,442, or little more than half the number are returned by the parents and heads of families, as scholars at home or at schools. This is dangerous, and a sad deterioration of the national strength.

We have next to observe the peculiarities of local density, and the increase or decrease of particular classes.

The extremes of density are 18 persons to a square mile in the district of Bellingham, Northumberland, and 185,751 within the same compass in the registration district of East London. In the London division, the mean proximity of individuals is now 14 yards; in the North Western division 67; in the West Midland 100; in Yorkshire 107; South Eastern division 118; South Midland division 120; South Western division 124; Eastern division 127; North Midland division 128; Northern division 142; Welsh division 157. In Scotland there are 6·9 acres to a person, in Ireland 3·1. In 1801, the people of England were on the average 153 yards asunder; in 1851 they are 108. On this head a recent writer (Mr. Mann) says:—"If the existing state of affairs were to continue without interruption or change, until the year 2,534, the inhabitants of Great Britain and Ireland, instead of each having a space of 108 square yards to himself, would all touch each other by their elbows. There would be just standing room for all, but no one must think of moving. Britannia with its twelve degrees of longitude, and nearly eleven degrees of latitude, would then look, from the ocean, like a huge rock covered by its impenetrable crowd of penguins or boobies."

In connection with the growth and distribution of the people, it is curious to observe that there are now very few more living in the rural districts, than there were in 1801. Much of the work that

sistence and comfort to twenty-eight millions of people, is the result of labour. In other words, it is the difference between a desolate country, such as this once was, and its present condition. What mine, therefore, was ever so rich in gold, as the mine of industry. England has maintained all her inhabitants, supported all her wars, repaid all her disasters, and, after all, has a clear property of 3,760,000,000*l.* in hand, or 134*l.* sterling per head for every man, woman, and child, in the three kingdoms, besides her foreign property. It is also supposed that Great Britain and Ireland are saving, upon an average, about 60,000,000*l.* every year."—R. EDLESTON.

was formerly done in the country, is at present done in towns. Agricultural implements are manufactured there, artificial manures made or imported, seeds sold, and a market found for produce of every kind. The towns absorb the surplus population of the country, and readily furnish employment to immigrants. On an average there are in the former 5·2 persons to an acre; in the latter 5·3 acres to a person. In the one 3,337 persons to a square mile; in the other 120 only. A glance at Mr. Petermann's Census Map will show that the increase in the population throughout Scotland, England and Wales, has been principally in the maritime and the mining, not in the agricultural districts. The hives of industry cluster thickly around the firths of the Clyde and the Forth, the plains and the coal-fields between the Cheviot Hills and the Grampians. The banks of the Mersey are thronged, the mouths of the Severn, the Thames, and the Tyne; but the central plain, the Wolds and the Downs, are thinly inhabited. Herefordshire, Shropshire, and Wiltshire, present a striking contrast to Lancashire, Yorkshire, and Staffordshire. The tendency of the population is evidently towards urban pursuits. On this head a very able writer says:—"In the rapid growth of towns in the United States, as in England, accompanying the cultivation of the soil, and encouraging, while they supply an ample reward for the labour of the agriculturist, we see the proof of the necessity of towns, even to the extension of agriculture. The mere cultivation of the soil, which bestows plenteous rewards on comparatively little labour, could not give employment to an increasing population. In the towns of England centre all the literature, all the art, and all the science of modern civilization, which make England pre-eminent amongst nations. They are the most progressive, if not the most important, part of the nation. Their inhabitants becoming daily more numerous, and more influential in the whole society, will most materially shape the future fate of Great Britain. This is not the adventitious result of any peculiar policy; it is natural and necessary. For help and protection, man clings to man, and skill and power are much more social than individual. Naturally and essentially gregarious, he is destined to congregate in masses; and the more population increases, the more numerous, and the larger, towns will become."

Our large towns, however, have frequently been the seat of privation and suffering, some of it self-inflicted, among both the possessors and the administrators of capital. The recurrence of such calamities is, if possible, to be averted. As division of labour is indispensable to success, and as dissatisfaction and disorder, arising from too partial views of things, seem inevitably to grow out of it, some more special preparation than any heretofore made, appears necessary to all who engage in business. What is wanted, is a better acquaintance with the principles of social economy, or the laws regulating the phenomena of industrial life.

But we have to do more than consider the numbers of the people and their aggregate means of support; we have also to consider the changes which a man undergoes in the course of his existence. Infancy and age, with all the ills that flesh is heir to, detract from the usefulness of life, and add to its burdens. If feebleness in

individuals, or in families, is fatal to their advancement; dwindling strength, and premature mortality, are no less so to the prosperity of a people. The proportion between the numbers of those who are incapable of exertion, and those who are in the prime of life, must be just and natural. The productive period of existence is short; unless it be prolonged to the utmost, as well as divested of every unnecessary incumbrance, little opportunity is afforded for making provision for declining years.

Great Britain contained, in 1851,

Under 1 year of age	578,543	Between 40 and 60 years of age	3,526,342
„ 15 years „	7,458,080	„ 60 and 80 „	1,414,798
„ 20 „ „	9,558,114	„ 80 and 100 „	129,483
Between 20 and 40 years of age	6,555,954	Above 100 „	319

The males at the soldier's age, 20-40, were, in 1851, 3,193,496. The number of the population at the age of 20 and upwards, exceeds the number under the age of 20, by 2,068,782. Taking into consideration the number of persons in the middle age of life, and of the ineffectives on account of age, and contrasting them with preceding periods, we find that *the strength of the nation has increased faster than its numbers*. Yet, from the foregoing table, it will be seen, that the population returns of our day, unlike those of ancient times, do not refer to the number of fighting men we could muster. Not more than one third of the inhabitants of Great Britain can fairly be considered self-supporting; and from the industry and frugality of these, directly or indirectly, the remaining two thirds principally derive their subsistence.

The commissioners state in their report, that there can be now no doubt that some of the twenty-one millions of people in Great Britain have lived a century, *which may, therefore, be considered the circuit of time in which human life goes through all the phases of its evolution*.

The probable lifetime of a male at birth, is nearly 45 years. The *mean* lifetime, or the average number of years that males live, after birth, in England, is rather more than 40 years (40·36 years), so that if the natural lifetime is conceived to be graduated and subdivided into 100 degrees (years), only 40 of these degrees of lifetime are traversed, on an average, by the children of the healthiest nation of any magnitude in the world! Hence the majority of us live only about two-fifths of the years others attain to, or, may we not rightly say, two-fifths of our appointed time? What would be thought, if our pocket watches could be got to work only two-fifths of the twenty-four hours? Were the full period of existence to be survived by all, that prolongation alone would be tantamount to more than doubling the present population.

The average duration of life is 45 years in Surrey, but 25 only in Manchester and Liverpool. Monstrous anomaly, that one individual in the former place should be equal nearly to two in either of the latter! The commissioners remark:—“As it has pleased the Author of the universe to make the food of mankind chiefly the product of labour, their clothing of skill, their intellectual enjoyments of education, their purest emotions of art, so health and the natural

lifetime of the race are in a certain sense to be, evidently, the creation of the intellect and the will." It is a pity that these principles are not more widely published; they can hardly be recognized and acted upon, unless universally taught.

It appears too that the population is now younger than it would be by the natural standard; younger, probably, in England and Scotland, than in any country in Europe. A larger proportion of the helpless may thus be thrown upon those who are in the prime of life; but a preponderance will be given, ultimately, to the youthful element in society, and consequently scope for the development of greater energy and enterprise. Such a state of things is favourable to progress. From the returns of the census of 1841, for the United States, we find there a predominance of the youthful element, to which some writers have ascribed the recklessness of the American people; others, probably, with more justice, their rapid development. There is no necessary connexion between age and wisdom: the young may want experience, but they need not be devoid of discretion, nor destitute of the light of knowledge. Our transatlantic brethren have determined to turn life to account as early as possible, and to give it the utmost attainable value: hence public provision is made that every free citizen may receive, nearly gratuitously, the highest kind of instruction the times can afford. Would that the example were followed in this country!

One great value of the Census of 1851 is, that from it may be deduced a new classification of society, the Industrial. Disregarding the adventitious and often absurd distinctions customary in historic records, the commissioners have grouped the population, naturally, into sixteen classes, which are subdivided into three hundred and thirty-two occupations, thus forming, as far as possible, a tabular view of the people as workmen and workwomen. I regret that time allows me barely to touch upon this part of the subject.

Some idea of the industrial qualifications of the people may be formed from the list given at p. 374.

Capitalists and the administrators of capital expect a fair return for their investments; they keep no superfluous hands, and cannot afford to encourage incompetency, yet they compete for the possession of the most productive labourers. A man who is in regular employ, and in receipt of the highest rate of wages for a responsible part in the preparation of a useful commodity, might justly look upon the distinction as one equal to any that colleges can confer upon him. Merely muscular labour cannot procure it: mental labour has taken the precedence. "The former is everywhere sinking, while the latter is rising in value. Industrial competition has resolved itself into a competition of intellect rather than of the cost of unskilled labour or the accidental indigenous possession of raw material." This being the case, every one will hope to find in the industrial occupations of the people of his native country, a preponderance of the intellectual element, and ample provision made, public and private, for securing its perpetuity. But my own conviction, after careful study, is, that by far the largest proportion of labour must be regarded as unskilled, and, consequently, least productive; and I cannot but deplore the immense amount of energy and capacity for culture thus lost to the

*Occupations in Great Britain, and Number of Persons engaged in them
(arranged in the order of the Numbers), in 1851.*

Occupations.	Persons.	Occupations.	Persons.
Agricultural labourer	1,460,896	Nail manufacture	28,533
Farm servant, shepherd	1,038,791	Iron-miner	28,088
Domestic servant	601,465	Printer	26,024
Cotton, calico manufacture, print- ing and dyeing	376,551	Nurse (not domestic servant)	25,518
Labourer (branch undefined)	306,767	Shipwright, ship-builder	25,201
Farmer, grazier	274,451	Stone quarrier	23,489
Boot and shoe-maker	267,791	Lodging-house keeper	23,089
Milliner, dress-maker	219,015	Lead-miner	22,530
Coal-miner	182,696	Copper-miner	22,386
Carpenter, joiner	*178,773	Straw hat and bonnet-maker ...	21,902
Army and Navy	152,672	Cooper	20,245
Tailor	146,091	Watch and clock-maker	19,159
Washerwoman, mangle, laun- dry-keeper	137,814	Brewer	18,620
Woollen cloth manufacture	114,570	Dock labourer, dock and harbour service	18,462
Silk manufacture	112,776	Clergyman of Established Church ..	18,587
Blacksmith	104,061	Protestant dissenting minister	9,644
Worsted manufacture	101,442	Police	18,348
Mason, pavior	101,425	Plasterer	17,980
Messenger, porter, and errand- boy	98,860	Warehouse—man, woman	17,861
Linen, flax manufacture	89,206	Saddler, harness-maker	17,583
Seamen, (merchant service), on shore, or in British ports	86,913	Hatter, hat manufacture	16,975
Grocer	80,946	Coachman (not domestic servant) } guard, postboy	16,836
Gardener	80,032	Law clerk	16,626
Iron manufacture, moulder, founder	75,721	Coach-maker	16,590
Inn-keeper, licensed victualler, } beershop-keeper	73,068	Cow-keeper, milk-seller	16,526
Seamstress, shirt-maker	67,989	Rope-maker	15,966
Bricklayer	67,691	Druggist	15,643
Butcher, meat-salesman	65,499	Surgeon, apothecary	15,163
Hose (stocking) manufacture	65,376	Tin-miner	15,050
School—master, mistress	63,660	Paper-manufacture	14,501
Lace manufacture	62,808	Coalheaver, coal labourer	14,426
Plumber, painter, glazier	62,472	Greengrocer, fruiterer	14,320
Baker	56,981	Muslin manufacture	14,099
Carman, carrier, carter, drayman ..	55,423	Confectioner	13,865
Charwoman	49,184	Tinman, tinker, tin-plate worker ..	13,770
Draper (linen and woollen)	48,082	Stay-maker	13,699
Engine and machine-maker	43,760	Solicitor, attorney, writer to the Signet	13,256
Commercial clerk	40,897	Dyer, scourer, calenderer	12,964
Cabinet-maker, upholsterer	40,575	Currier	12,920
Teacher (various), governess	38,294	Builder	12,818
Fisherman, woman	37,683	Farm bailiff	12,805
Boat, barge, man, woman	37,268	Hair dresser, wig-maker	12,173
Miller	36,512	Coal merchant, dealer	12,092
Earthenware manufacture	35,443	Glass manufacture	12,005
Sawyer	34,306	Carpet and rug manufacture	11,457
Railway labourer	32,062	Goldsmith, silversmith	11,242
Straw-plait manufacture	31,168	Brass founder, moulder, manufac- turer	11,230
Brick-maker, dealer	30,963	Maltster	11,150
Government civil service	30,553	Railway officer, clerk, station- master	10,948
Hawker, pedlar	30,244	Bookbinder	10,953
Wheelwright	29,882	Road labourer	10,923
Glover	29,800	Wine and spirit merchant	10,467
Shopkeeper (branch undefined)	29,408	Fishmonger	10,439
Horsekeeper, groom (not do- mestic) jockey		Merchant	10,256
		Ribbon manufacture	10,074

* This is the Army and Navy of the United Kingdom, exclusive of the Indian Army and Navy.

community,—lost, perhaps, without fault in the parties concerned. For it seems to me that the mode of gaining a livelihood is more often determined by chance than by intelligent choice; that the humbler walks in life are crowded chiefly because they require little preparation to enter them, and not because they are more congenial to the taste of any class, or more remunerative. Want of health, want of common instruction, more than want of money, keep multitudes in a state of unprofitable occupation.

The first on the list is a body of 1,460,896 persons. There is no reason why agricultural labourers need be unlettered, and so destitute of common resources as to be one of the first to fall helpless in seasons of difficulty; experience, however, says that they have proved such, and that the factory operatives, of whom there are, in cotton and calico only, more than half a million, are nearly the same.

The advanced age to which domestic servants remain in servitude is some proof, that however desirous of independence they may be, their industrial capabilities do not enable them very early, or very generally, to achieve it. Only one family in eight or nine throughout Great Britain affords, apparently, to keep a domestic, yet their number is so large. 376,551 individuals style themselves labourers, and, nevertheless, are unable to assign any of 332 occupations pursued as that to which they specially attach themselves. They offer to “lend a hand” whenever they are able. In the various branches of business some curiosities occur. The milliners and dress-makers, for one sex only we may presume, nearly equal the boot and shoemakers for both sexes. In time of peace the carpenters and joiners outnumbered the forces both by land and sea. The tailors outnumbered the butchers, bakers, and brewers, taken collectively. The laundresses nearly equal the tailors, and, according to Dr. Lyon Playfair, the washerwoman’s interest in a dozen shirts amounts to 7*l.* 16*s.*, or more than double that of the producer, the cotton-spinner, and the shirt-maker. Messengers, porters, and errand-boys, are 101,425. For every inn-keeper, licensed victualler, or beershop-keeper, there seems to be a poor seamstress or shirt-maker. The coopers are rather more than the clock and watch-makers (20,245 and 19,159). Medical men and their assistants are 18,728. The brewers are 18,620. The clergy of the Established Church 18,587. The police 18,348. Lawyers 16,763. The druggists and the surgeons differ little in numbers, but there are rather more drug-vendors than milk-sellers. In the paper manufacture we find 14,501. Railway officers, clerks, and station-masters are 10,948, while the old road labourers are 10,923. The wine and spirit merchants specially are 10,467, general merchants 10,256.

One or two other points only can be noticed connected with numbers. 1·317 per cent. of the men of the country are engaged in Government. 26 per cent. of the men and 8 per cent. of the women, twenty years of age and upwards, with 8 per cent. of the boys and 3 per cent. nearly of the girls, under twenty years of age, are employed in agricultural pursuits. 7 per cent. of the 5,458,815 men of the age of twenty and upwards are engaged in the construction of houses; more than 17 per cent. of the population are engaged in trades, mechanical arts, handicrafts, and manufactures, including mining. Railways absorb 28,353 individuals, the telegraph service 282.

One of the first ideas suggested by a consideration of the preceding statements is, How far can the existing division and classification of labour be considered permanent?

As this is the first labour list we have had made out, changes may be expected. It is to be hoped that improvements will take place in industrial processes. The lectures on the Results of the Great Exhibition of 1851, delivered before the Society of Arts, Manufactures, and Commerce, at the instance of H. R. H. Prince Albert, are very suggestive on this head, particularly that of Dr. Lyon Playfair. He seems to think the signs of the times significant,—that there are many errors to correct, many exigencies to supply. Under the stimulus of increased competition new powers will be called into action, complex processes will be simplified, manual dexterity will be elevated to mental ability, or driven out of the market by labour-saving machinery,—but all will assuredly be accomplished in accordance with the operation of natural laws, known or discoverable. Those alterations may be anticipated which we know to be required, for there is ever a close connection between the necessities and the improvements of an age.

It is happy for us that in a free community no kind of labour should be found repulsive to all. The diversity of capacity and ability provides for every social requirement. But all should be trained to feel that industrial talent or energy misapplied is national loss. To suffer either to lie dormant is positively sinful, socially and individually. A kind of talent, equal to the requirements of ordinary life, is easily put forth by its possessor; but most men have latent powers which the force of example or the pressure of circumstances only can call into action. Hence the importance of pointing to the higher aims of existence, and proclaiming them within the reach of all men. Hence the necessity of able expositions of the nature of the human mind, the laws by which it is regulated, and the purposes to which it may be applied. Let the wants of the day be made plain, and to meet them the aid of the humblest invited. Let competition be courted in the practical solution of problems like these: "To what extent can competence displace pauperism? How nearly can we free ourselves from the low-minded and the vicious, not by their expatriation, but by their elevation? To what extent can the resources and the powers of nature be converted into human welfare, the peaceful arts of life be advanced, and the vast treasures of human talent and genius be developed? How much of suffering, in all its forms, can be relieved, and, what is better than relief, how much can be prevented?"

In some respects our career, commercial and manufacturing, has been one of monopoly. We have not, as yet, exerted our utmost strength. Our grandest movements, probably, await the hour of contest with rival powers. It will be a crisis. There may be peril at such a period, but we trust we shall pass through it proudly. Nations, like individuals, display new life in their struggles, when dearest interests are staked. Preparation, however, is imperative. The Exhibition of 1851; and the more recent one at Paris, indisputably prove it. In our industrial efforts on the former occasion, it was remarked that although we bore away the palm on many points, our supremacy was in general stoutly challenged, and, in some cases,

utterly denied. Superiority, which seemed our own by hereditary right, was slipping from us. Our long experience in particular departments of labour gave us a degree of mechanical excellence which remains unrivalled, but this is chiefly the case in matters with which we and the world at large had long been acquainted. Where the highest kind of labour, that of invention or discovery, was called into requisition, we were not always, nor indeed generally, first. It was clearly demonstrated that the countries most distinguished for the universal spread of mental culture were foremost.

Our professors of science are singularly few (464); we hear on all sides that they are badly remunerated; what wonder if the sons of industry, discovering their poverty, should rather be deterred from the pursuit of knowledge than drawn to aid in its advancement.

This highest kind of labour, invention and discovery, exercises mighty influence on the destinies of mankind. It has wrought more revolutions, real and lasting ones, than all the conquerors in the world. Some of its lower forms merely, those of mechanical contrivances, gave us the control of cotton manufacture. Higher and nobler was the discovery of steam as a motive power. The two united produced the factory system, of which a modern writer says, "the philosophy of the schools supplies very imperfect help for estimating the results, because an innovating power of such force could never have been anticipated. The steam-engine had no precedent, the spinning-jenny is without ancestry; the mule and the power-loom entered on no prepared heritage, they sprang into existence, like Minerva from the brain of Jupiter, passing so rapidly through their stage of infancy, that they had taken their position in the world, and firmly established themselves, before there was time to prepare a place for their reception in a land already crowded with institutions." "But in our day," says another writer, "the imponderable properties of matter, as they are sometimes called, are in a state of rapid development. They will most probably play an important part in the progress of human society. The sun has become a limner, the electric fluid a postman, galvanism thrusts aside the goldsmith, and chemical action dispenses with the aid of mechanical agency." If these operate changes equal to the preceding, should we not be preparing for the consequences? The work of the world cannot be performed by ignorant men: intelligence is entering more and more largely into the conception of all our projects, the execution of all our plans.

What we term invention and discovery are but new applications of long existing powers, expositions of natural processes previously unnoticed. Both depend upon a knowledge of the laws of nature, resulting from industrious and enlightened research. They give to the nation that produces them, immeasurable superiority. They are attainable by all, for their successful culture is influenced by fixed principles. They are the finest ears of corn selected from the fairest fields, and will be found not by the wayside, but where the husbandry is best,—where nothing is neglected to render the soil fertile and the seed superior.
